

Ultra low level deep water ^{137}Cs activity in the South Pacific Ocean

M. Aoyama¹, Y. Hamajima²

¹Meteorological Research Institute

²Low level Radioactivity Laboratory, Kanazawa University

We are measuring ^{137}Cs concentrations of deep water samples in the subtropical gyres in the South Pacific collected during the BEAGLE2003 cruise (Aoyama et al., 2006) at an underground facility (Ogoya Underground Laboratory: OUL, Hamajima & Komura, 2004; Komura & Hamajima, 2004) to achieve extremely low background γ -spectrometry using Ge detectors with high efficiency and low background materials. A detection limit of ^{137}Cs at the OUL is 0.18 mBq for a counting time of 600000 seconds (Hirose et al., 2005). There is a residual problem of underground γ -spectrometry for ^{137}Cs measurements. AMP adsorbs trace amounts of potassium when Cs is extracted from seawater, therefore trace amounts of ^{40}K cause elevation of background corresponding to energy range of ^{137}Cs due to Compton scattering of ^{40}K . To remove ^{40}K from the AMP/Cs compound, a precipitation method including insoluble platinate salt of Cs was used (Aoyama and Hirose, 2008).

We did 1500000 seconds to 2500000seconds measurements for combined samples from deep water to reduce counting error for the samples of which net activities were around 0.5 - 1 m Bq. We have obtained reliable value of ^{137}Cs activity in the deeper layers. ^{137}Cs activity at the layers between 2000-4500 m ranged from 14 +-5 mBq m⁻³ to 21 +- 9 mBq m⁻³. The inventory of ^{137}Cs from surface to 1000 m depth ranged from 270+-100Bq m⁻² to 1050+-130 Bq m⁻², while the inventory from 2000 m to the sea bottom is estimated to be about 50 to 80 Bq m⁻² in this region.

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